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UNIVERSITY OF CALIFORNIA, BERKELEY

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THE PAST'S FUTURE*

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Reading the papers for presentation at this conference was quite impressive to me as philosopher. It might be accurate to say the theme of the conference is as much the philosophy of accounting as it is accounting theory, since so many of the speakers have dipped into philosophical literature and philosophical concepts.

I need not apologize, therefore, because this paper also takes on so strong a philosophical role. But in addition to the philosophical discussion I also have a very practical question to raise about the strategy of the practicing accountant.

My philosophical question has to deal with the role of the future in attempts to describe the past. The practical translation of this problem is the extent to which the accountant per se needs to become involved in some form of forecasting.

Common sense provides a rather ready answer to the question of the role of the future in the attempts to describe the past; the future has no role. That is to say, the practicing accountant need not concern himself with forecasting; perhaps one might want to go so far as to say that the practicing accountant, especially the C.P.A., is obligated to keep himself free of forecasts.

Built into this common sense reply to the question is a preconception. Many of us have come to recognize how treacherous common sense preconceptions can become, especially as they dig themselves like ticks into the living

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flesh of a scientific discipline. A student of mine has been conducting what he calls "black box experiments." The subject has a black box whose "theory" he is supposed to describe. He gets his information by putting four numbers into the box, then observing the four digit output. In one of the black boxes the output is the time of day. It takes many of the subjects quite a bit of effort to realize that there is no relationship between what they are putting in and what is coming out, because "time of day" is not one of their preconceptions for such a black box. This is just illustrative of the kind of fix that our preconceptions can get us into. Professors often tell their students to "write down all of their preconceptions," but this piece of advice may be of little value, because if one could write down his inmost preconceptions then they would not be "inmost." In this conference, however, it is possible that an outsider, joining in a serious discussion with theoreticians and practitioners, may perform some service by writing down what he observes to be some common preconceptions which seem to be the foundations of accounting theory. In a way, it is the broad task of philosophy to shatter the old tablets, so to speak. As Nietzsche said, "All the secrets of your foundation must come to light; when you are uprooted and broken in the sun, your lie will be separable from your truth."[1]

Suppose we begin with the common sense preconception just mentioned. This is the preconception of a mind "bound to the past." For such a mind the past is sure; it is a "fact," a firm foundation, value free. The future, however, is unknown, uncertain, vague, treacherous, and threatening, and,

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[1] F. Nietzsche, Thus Spoke Zarathustra, Gateway Edition, p. 93, translated by M. Cowan.

if you wish, value-loaded. For the past-bound we all know how we have lived. But what can we know of life in the future, or life after death?

Two historical examples will suffice. David Hume in his famous Treatise argues that the future is not known in the sense that direct experience is known. Indeed, from Hume's point of view, the kind of knowledge that arises from experience and memory is totally different from the kind of knowledge that is entailed in forecasting. Hume believes that it is natural for people to try to forecast. Anyone having seen a flash would expect that the noise of an explosion will occur, or having seen the heat on the stove that it will cause a sensation of warmth. But this is expectation based on habit, and is totally different from the kind of knowledge which we acquire from observation. If we were to plot a chart in which the ordinate shows certainty and the abscissa time, then up to the moment of the time of the experience, there is no certainty at all. At the time of the experience, there is a sense impression, and if it is intense enough, there is considerable certainty attached to it. After this point in time, said Hume, there will be a decay of certainty as memory enters in and begins to distort what has been directly observed.

A second example comes from the story of historical method into the nineteenth century when von Ranke made the distinction between "official" records where one can obtain objectivity, and the "subjective" accounts of eye witnesses and other individuals. Von Ranke was arguing that the historian's job is to sift out the subjective accounts that have no real objectivity and devote his time to assimilating and accurately recording historical events as they are written down in various kinds of records. The similarity between von Ranke's philosophy and the one that many accountants hold seems notable. The operating statement and the balance sheet are frequently

regarded as the results of the official records of the company, carefully examined by the accountant, and are not based on subjective impressions of managers and other individuals.

In order to look carefully at the common sense preconception that the future plays no role in the past, suppose we write out four propositions for consideration. In order to do this we need to say something about systems and especially their components. In system science, a system is conceived as a set of components which play the role of serving the basic purposes of the whole system. In designing such systems, the systems scientist has to pay due regard to the way in which the effectiveness of one component is related to the effectiveness of another.

In the simplest case, we say that one component A is "separable" from another component B if the effectiveness of A does not depend in any way on the effectiveness of B. If we could write down the relationship in mathematical terms we would say that A's effectiveness is measured by variables which are causally independent of the activities occurring in B.[2] For example, if two workers are engaged in digging a ditch it may happen that the effectiveness of one worker is largely independent of the effectiveness of the other. Even in this simple case, however, one might suspect that pure separability does not occur. Indeed, it is safe to say that pure separability never occurs in social systems.

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[2]The concept is often expressed by saying that the total system's separability can be represented in a linear form, i.e., as a linear function of the effectiveness of each of the components. In this regard it should be noted that one could not arrive at such a judgment of linearity without having taken a look at the larger system and made some judgment about it. So even in the case where the systems scientist arrives at a linear function some nonlinearities have probably crept into his considerations.

Now let us look at a system the purpose of which is to tell as nearly as possible the accurate story of what has happened, as well as what will happen. In such a system we could identify two activities, one of which devotes itself primarily to telling as accurately as possible what has happened (or is happening), and the other to telling what will happen.

The four propositions are the following:

1. The activity of estimating what has happened in the past is separable from the activity of estimating what will happen in the future.

An abbreviated form of this proposition might be "past reckoning is separable from future reckoning."

2. Future reckoning is separable from past reckoning.

3. Any specific activity of estimating what has happened in the past can be evaluated along an effectiveness scale ranging from 0 or a negative number to some maximum positive number.

In other words, this proposition states that it is possible to describe what has happened in the past and one can do so with more or less effectiveness. The proposition does not state one can describe the past with complete accuracy; it only states that there is a worse and a better method of describing the past. A brief version of this statement would be "knowledge of the past is possible."

4. Knowledge of the future is possible.

Here, as in proposition No. 2, I have used the abbreviated form.

Now we can bring in a logician to consider our four propositions; he will tell us that these can be accepted or denied, each one in turn, and that the result of such acceptances and denials are 16 possible positions. Thus, one can accept all four of the propositions, or one could accept the first three and deny the fourth, etc. However, there is a consideration

which reduces the list of possible opinions which these four propositions express. Suppose, for example, that you believe that proposition No. 4 is false; that is, you do not believe that knowledge of the future is possible. In the way in which I have expressed the meaning of proposition No. 4, your denial amounts to your saying that any activity engaged in trying to study the future will be absolutely ineffective. Hence you believe there is no effectiveness measure associated with such an activity. If now we look at proposition No. 2, which in its complete form says that the activity of estimating what will happen in the future is separable from the activity of estimating what will happen in the past, we see that the proposition is largely meaningless if one has already accepted the idea that knowledge of the future is not possible. What the logician suggests at this point is a "vacuous" stipulation regarding the concept of separability, i.e., a kind of arbitrary decision as to what is to be done when an activity has no effectiveness measure associated with it. The arbitrary decision made here will be that if one argues that an activity has no effectiveness with respect to the total system, then one arbitrarily states such an activity is non-separable from all other activities.[3]

If we make our arbitrary stipulation, it therefore follows that if one denies proposition No. 4 he will also deny proposition No. 2. Put otherwise, if he accepts proposition No. 2 he is committed to accepting proposition No. 4. This means that one cannot under the arbitrary stipulation consistently accept proposition No. 2 and deny proposition No. 4. Similarly,

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[3]The situation is very much like the one pertaining to the so-called null class in Boolean algebra, where the logician has to decide whether a class that has no members belongs or does not belong to other classes. In logic, it has been customary to say that the null class belongs to all classes; this rule produces certain conveniences in the calculus.

one cannot accept proposition No. 1 and deny No. 3.

One final minor point rules out another two possibilities; a position which asserts that knowledge of the past is possible (accepts No. 3) but is non-separable from the knowledge of the future (denies No. 1), and goes on to say that knowledge of the future is impossible (denies No. 4) would be a ridiculous position to take. A similar remark can be made for the "dual" of this in which past and future are interchanged.

What remains are seven consistent proposals as follows: (We use the convention that an apostrophe after the number represents the denial of the proposition.):

1, 2, 3, 4: "Separated past and future."

1, 2', 3, 4: "Forecasting from the past."

1', 2, 3, 4: "Past reckoning from the future."

1, 2', 3, 4': "Past but no future reckoning."

1', 2, 3', 4: "Future but no past reckoning."

1', 2', 3, 4: "Integrated past and future."

1', 2', 3', 4': "Skepticism."

With appropriate apologies for this logical exercise, suppose now we examine these seven consistent statements, or rather all of them except the last. I assume that in this audience there can be no real interest in skepticism, because if one were to adopt it, the whole activity of the accounting profession becomes a kind of sardonic joke.

In this examination, as I hinted at the beginning, I would like to take both an epistemological and a strategic look at the propositions. By a strategic look, I mean that a practitioner might agree, for example, that the future can be predicted, but assert that it is none of his business to predict it. I gather this feeling has entered into some of the policies

regarding CPS's. I'll be interested in both the epistemological and the strategic discussion of the propositions.

At the outset I mentioned what I thought would be a common preconception; namely, that one could tell the past but one could not tell the future, or strategically it is none of his business to tell the future. This is expressed in the fourth of the list of positions which I have dubbed "Past but no future reckoning." It is a series of propositions that has often been accepted by strong positivists, or individuals in disciplines like history who have felt that man can know what his past has been like, but is completely incapable of predicting the future even approximately. We'll see as we progress in the discussion that this particular piece of common sense has many shades of meaning.

The opposite of the common sense position is the one I have called "Future but no past." This says that one can tell very well what is going to happen, but one cannot tell what did happen. For example, a man whose wife has just told him that she is going to divorce him and marry the iceman believes he can predict what will happen, but does not have any idea what did happen. However, there is no discipline of science that I know of which would accept this combination of assertions and denials. The past has always been such a fundamental part of scientific inquiry that to deny the possibility of saying anything sensible about it would seem to aim at the very heart of the scientific method itself.

The position, however, that I want to argue most strongly for, and which is the "deadly enemy" of the common sense preconception, is the one called "Integrated past and future." This position, too, has many different shades of meaning, depending on how the future enters into the determination of the past. I want to give its strongest possible meaning, and for this

purpose I'll turn to operations research.

Professor Chambers in his paper makes a distinction between a "report" and "physical fact." He illustrates this in the case of inventory, where, he says, the report contains the items described by numbers, whereas the physical facts are the items actually in inventory that can be observed. From this illustration one might infer, as did Hume in the discussion above, that the direct observation of the physical condition of inventory is more reliable than the report, the report representing Hume's "decay in memory."

But the question that faces the operations researcher is the meaning of "reliable." The operations researcher's task is to assist the decision maker in controlling inventory; he will do this by trying to decide on the optimal amounts to be ordered into inventory at various points of time.

Now what are the appropriate data that the operations researcher should use in making his study in order to assist the decision maker? An obvious reply to this question, a reply that is contained in many operations research text, is to say that the operations researcher should examine past invoices. The student is told to make a frequency chart, using certain intervals of time, e.g., a day, a week, or a month. This provides the basis of his inferring the probability distribution of demand on inventory. He is also cautioned to observe trends in time, e.g., seasonal fluctuations, or gradually rising or falling sales demand, and to extrapolate into the future on the basis of these trends.

These recommendations to the operations research student in fact are based on what I labelled "Future reckoning from the past," i.e., the recommendations are based on the assumption that past reckoning is independent of future reckoning but not vice versa. But a moment's reflection shows the weakness of this position. Suppose, for example, that there is a

seasonal fluctuation of demand. Then it may be very sensible during the off-season to reduce prices and increase advertisement in order to smooth the demand curve. If this were done, then obviously the use of very careful statistical analysis of past data, and an extrapolation of seasonal fluctuations into the future would be largely irrelevant because a new kind of demand system would have been created. In the language of system science discussed above, it is quite obvious that the demand system is not separable from the inventory system. If one does use past demand and makes the kinds of extrapolations mentioned above, he is making a very strong systemic judgment, namely, that nothing can be changed about the demand system, e.g., because the managers are reluctant to make such changes or else because the customers are fixed in their patterns of purchasing.

The same remarks apply to the determination of cost by operations researchers. Obviously in the case of inventory it is necessary to determine the cost of holding items in inventory. This cost is an opportunity cost. It is an inference as to how a dollar released from inventory could best be spent in some other activity of the firm. Opportunity costs are what some philosophers of science call "counterfactual conditionals."[5] The counterfactual conditional has the form, "If X were to occur, then Y would occur." In the case of the cost of holding inventory, for example, the counterfactual conditional is "If inventory were to be reduced by such and such an amount, then the released funds could optimally be used to yield P percent return." It is to be noted that the demand on inventory is also an "opportunity demand," i.e., based on counterfactual conditional of the form, "If such and such were to be done to the demand system, then the demand function would be so and so."

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[5]See Nelson Goodman, Fact, Fiction and Forecast.

What is it that the operations researcher observes in order to provide information for decision-making purposes? We have heard a good deal at this conference about how information should be generated for decision-making, so that the question is quite relevant: what does one observe in order to verify a counterfactual conditional? At first glance, the problem seems impossible to solve; how can I observe anything in order to judge what would happen (but never does)? This is why Goodman calls these conditionals "counterfactual." Their premises never "in fact" occur in nature. So it begins to appear as though operations researchers must be spinning their wheels.

But the situation is not hopeless. If one were willing to make a judgment about the future of the whole system, then on the basis of this judgment he would be justified in using a certain kind of data. Suppose, for example, that one makes a judgment that nothing can be changed about the demand system. Then on the basis of this judgment and the additional judgment that the system will exist in essentially the same environment as it has in the past, one would be justified in taking past invoices and performing the exercise specified above, i.e., extrapolating into the future and using these extrapolations as the basis for calculating optimal inventory policy. In other words, if a strong systemic judgment is made, then a certain kind of data bank based on past observation can be said to be "authorized." If no systemic judgment seems sensible to make, then of course the operations researcher must regard the problem as intractable.

We see that information for decision-making is really a compound of at least two kinds of activities: the one concerned with <u>authorizing</u> a certain set of data for use on the analysis, and the other in the collection of the data itself. But the authorization procedure is essentially a

forecast about the future, because it makes a judgment about the characteristics the system will or would have. It is in fact much more than a simple forecast, because it must be a model which permits one to say what would happen if certain things were to occur. In this regard the systemic judgment is much more like a set of differential equations in physics, where the boundary conditions can be changed and one can infer which events would occur under these changes.

It is clear that the authorization of a data bank is "future reckoning." We can now understand how past reckoning is inseparable from future reckoning, because we need to make very strong and effective judgments about the future in order to be able to use the past effectively. I might add that the reverse is also clear; that is to say, effective reckoning of the past is essential, because effective judgments about the future of the system must somehow draw on past experience. Hence, future reckoning is non-separable from past reckoning, and vice versa. From these remarks we can conclude that the operations researcher must adopt the position I labelled "Integrated past and future."

What relevance is all of this discussion to the accountant? At this conference we have been swinging between two positions: the one in which there is chiefly a concern with the practicing accountant and his problems of collecting information, and the other with the broader question of the accountant as an information collector and as an aid to the decision-maker. I would say that the distinction between the two positions is essentially the strategic question as to whether or not the accountant should be involved in what I called authorization of data banks, i.e., whether the accountant should be involved in the very difficult problem of making adequate systemic judgments. One might adopt the position that the accountant essentially

gathers the data, and the authorization is made by the managers or by the legal system. This position would argue for a separability of the information system from the decision making system, where the accountant does one kind of job and the managers or lawyers do the other kind of job. I think the position is undoubtedly weak in terms of system design. But the real issue depends, so to speak, on the ambition of the accounting profession. Does it wish to become involved in authorizing data banks, and hence in making strong systemic judgments?

I have argued elsewhere[6] that information becomes measurement if the information is widely usable in a variety of contexts. I gather from some of the papers in this conference, e.g., Sprouse and Rappaport, that at least some accountants do regard their data in terms of the user and his characteristics, and are seeking to make accounting a measurement process. If so, then I would infer that these accountants are strongly involved in considerations of the authorization of data banks based on strong systemic judgments.

In concluding, I would like to make several remarks about the "Integrated past and future" position of a general nature. We are going through an age where we are reconsidering many of our traditional human values. From the point of view of science of the last century, precision, rigor, and clarity were desiderata. The scientist, it was believed, should become clear and precise about his position, and his position should essentially be a consistent one. These values led the scientists to regard descriptions of the past in terms of the "quality of the reports." Reports should be specific, concrete, and unobjectionable. According to this past value system, when we look at the most vital event in the life of a company say, namely

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[6] Prediction and Optimal Decision, 1960.

a "sale," one would tend to regard "dollar amount" and "quantity ordered" as representing the highest quality a report can attain. We note, however, in terms of our earlier discussion, that the quality of being clear and precise may be at variance with the quality of best serving the user. What does the stockholder think when he reads the line "gross sales"? If he is sensible he will wonder "What might sales have been?" He is indeed raising the counterfactual question again. And the answer to his question must be based on a strong systemic judgment which, I believe, will inevitably be ambiguous, not clear and precise, and certainly not unobjectionable. We live in a world where we have to make strong systemic judgments in order to make our decisions, but if we are honest we will see that we will forever fail to find the unobjectionable basis for these systemic judgments that authorize the use of certain data banks. So the quality of the report as a concept has changed in terms of a new set of values. On the positive side, this new set of values represent a willingness to be as honest as possible about the basis of our decision-making. Along with this willingness goes, by necessity, the need to accept ambiguity, vagueness and incomplete consensus as essential qualities of our reports.

I would like to close with a very general philosophical opinion about which I hope there will be considerable debate, for debate is the essence of everything I have discussed in terms of systemic judgments.

I realize, as Norton Bedford has, that we have been developing a culture which pays more and more respect to the future--to what it will be or should be--in 1984, 2000, or 10,000. But in this paper I have really been putting in a plea for our respect to the past, to what it was and might have been. It is really quite disrespectful for us to assume that the past was simple and easy to describe. What was it like to be alive in the

year 1800? No amount of historical data could possibly probe the depth and complexity of such a question. The past is as deep an uncertainty and ambiguity as is the future.

While I appreciate the urge for accounting to limit and define its task, I also appreciate the need for it to expand its horizons and to identify its allies who are all those who are devoting their lives to the worship of the past. There was a time when basic science regarded itself as one form of the adoration of God. The ritual of this form of worship of God by worshipping the past entails the enormous and heroic task of telling the future.